CLAIMS

What is claimed is:

1. A method of preparing microelectronic components, comprising:

applying an adhesive layer on at least a portion of a rear surface of a microelectronic wafer, the adhesive layer having a first surface in contact with the rear surface of the wafer and a second surface oriented away from the wafer;

defining a plurality of separable, spaced-apart adhesive pads within the adhesive layer;

contacting the second surface of the adhesive layer with a mounting member;

dicing the wafer into a plurality of microelectronic components, each microelectronic component having a back surface to which at least one of the adhesive pads is attached; and

separating the microelectronic components and their attached adhesive pads from the mounting member, leaving a remainder of the adhesive layer.

2. The method of claim 1 wherein the adhesive pads are defined by cutting the adhesive layer without cutting through the wafer.

3. The method of claim 1 further comprising selectively treating the adhesive layer to yield a first adherence between the mounting member and second surfaces of the adhesive pads and a second, greater adherence between the mounting member and the remainder of the adhesive layer.

4. The method of claim 1 further comprising positioning a mask between the adhesive layer and a radiation source.

5. The method of claim 4 further comprising delivering radiation through the mask to selectively expose either the adhesive pads or the remainder of the adhesive layer.

6. The method of claim 5 wherein the radiation exposure is selected to alter adhesion between the adhesive layer and the mounting member such that the mounting member is less adherent to the adhesive pads than to the remainder of the adhesive layer.

7. The method of claim 4 further comprising delivering radiation through the mask to selectively expose the adhesive pads, thereby reducing adhesion of the adhesive pads to the mounting member.

8. The method of claim 1 wherein the back surface of each microelectronic component has a surface area greater than a contact area of the adhesive pad in contact with the back surface.

9. The method of claim 1 wherein dicing the wafer comprises cutting through the wafer to a depth spaced from the mounting member.

10. The method of claim 1 wherein separating the microelectronic components and their attached adhesive pads exposes an adhesive surface of the adhesive pad, the method further comprising attaching the exposed adhesive surface of an adhesive pad to an active surface of a microelectronic component mounted on a substrate.

11. A method of applying adhesive pads to a plurality of microelectronic components, comprising:

applying an adhesive layer on at least a portion of a rear surface of a microelectronic wafer, the microelectronic wafer comprising a plurality of microelectronic components, each of which has a back surface;

defining a plurality of separable, spaced-apart adhesive pads within the adhesive layer, each of the microelectronic components having an adhesive pad attached to its back surface with the adhesive pad covering less than the entire back surface; and

singulating the microelectronic components.

12. The method of claim 11 wherein the adhesive pads are defined by cutting the adhesive layer without cutting through the wafer.

13. The method of claim 11 further comprising separating the microelectronic components and their associated adhesive pads from a remainder of the adhesive layer.

14. The method of claim 11 further comprising positioning a mask between the adhesive layer and a radiation source.

15. The method of claim 11 further comprising contacting the adhesive layer with a mounting member prior to singulating the microelectronic components.

16. The method of claim 15 further comprising selectively treating the adhesive layer to yield a first adherence between the mounting member and second surfaces of the adhesive pads and a second, greater adherence between the mounting member and the remainder of the adhesive layer.

17. The method of claim 15 further comprising positioning a mask between the adhesive layer and a radiation source and separating the microelectronic

components and their associated adhesive pads from a remainder of the adhesive layer.

18. The method of claim 17 further comprising positioning a mask between the adhesive layer and a radiation source and delivering radiation through the mask to selectively expose the adhesive pads, thereby reducing adhesion of the adhesive pads to the mounting member.

19. The method of claim 17 further comprising delivering radiation through the mask to selectively expose either the adhesive pads or the remainder of the adhesive layer.

20. The method of claim 19 wherein the radiation exposure is selected to alter adhesion between the adhesive layer and the mounting member such that the mounting member is less adherent to the adhesive pads than to the remainder of the adhesive layer.

21. The method of claim 11 further comprising contacting the adhesive layer with a mounting member after defining the adhesive pads and prior to singulating the microelectronic components.

22. The method of claim 11 further comprising contacting the adhesive layer with a mounting member prior to singulating the microelectronic components, singulating the microelectronic components comprising cutting through the wafer to a depth spaced from the mounting member.

23. The method of claim 11 wherein singulating the microelectronic components comprises dicing the wafer.

24. The method of claim 11 wherein singulating the microelectronic components comprises cutting through the wafer without cutting through an entire thickness of the adhesive layer.

25. The method of claim 11 wherein the adhesive pad of each singulated microelectronic component has an exposed adhesive surface, the method further comprising attaching the exposed adhesive surface of an adhesive pad to an active surface of a microelectronic component mounted on a substrate.

26. A method of assembling a stacked microelectronic component assembly, comprising:

attaching a first microelectronic component to a substrate with an active surface of the first microelectronic component oriented away from the substrate;

applying an adhesive layer on at least a portion of a rear surface of a microelectronic wafer;

defining a plurality of spaced-apart adhesive pads within the adhesive layer;

dicing the wafer into a plurality of second microelectronic components, each microelectronic component having a back surface to which at least one of the adhesive pads is attached, the adhesive pad covering less than the entire back surface to which it is attached;

attaching one of the second microelectronic components to the first microelectronic component by contacting the active surface of the first microelectronic component with the adhesive pad attached to the second microelectronic component.

27. A microelectronic subassembly, comprising:

a microelectronic wafer having an active surface and a rear surface, the wafer comprising a plurality of microelectronic components, each of which has a back surface, and a plurality of streets between the microelectronic components;

an adhesive layer having a first surface in contact with the rear surface of the wafer and covering the back surfaces of the plurality of microelectronic components, the adhesive layer comprising an array of separable adhesive pads spaced by adhesive boundaries, each adhesive pad being in contact with the back surface of one of the microelectronic components and each adhesive boundary being aligned with at least one of the streets of the wafer.

28. The microelectronic subassembly of claim 27 wherein the adhesive pads have peripheries defined by cuts in the adhesive layer.

29. The microelectronic subassembly of claim 28 wherein the cuts extend through substantially an entire thickness of the adhesive layer.

30. The microelectronic subassembly of claim 28 wherein the cuts define perforations between the adhesive pads and the adhesive boundaries.

31. The microelectronic subassembly of claim 27 wherein the adhesive boundaries are joined in a continuous structure defining a grid between the adhesive pads.

32. The microelectronic subassembly of claim 27 wherein the adhesive pads and the adhesive boundaries comprise the same material applied as a continuous adhesive layer and subsequently cut to define the adhesive pads and the adhesive boundaries.

33. The microelectronic subassembly of claim 27 wherein each of the microelectronic components has a back surface, each adhesive pad covering less than the entire back surface of the microelectronic component to which it is adhered.

34. The microelectronic subassembly of claim 27 wherein the adhesive layer has a second surface oriented away from the wafer, further comprising a mounting member in contact with the second surface of the adhesive layer.

35. The microelectronic subassembly of claim 34 wherein the mounting member comprises a backing tape and a release liner, the release liner being carried between the backing tape and the adhesive layer.

36. The microelectronic subassembly of claim 34 wherein the mounting member is less adherent to the adhesive pads than to the adhesive boundaries.

37. The microelectronic subassembly of claim 34 wherein the adhesive layer comprises a radiation-sensitive material adapted to change adherence to the mounting member in response to exposure to radiation.

38. The microelectronic subassembly of claim 34 wherein the adhesive layer comprises a radiation-sensitive material which reduces adherence to the mounting member in response to exposure to radiation.

39. A microelectronic subassembly, comprising:

a microelectronic wafer comprising a plurality of microelectronic components, the wafer having a rear surface;

a mounting member having a mounting surface oriented toward the rear surface of the wafer; and

an adhesive layer having a first surface adhered to the rear surface of the wafer and a second surface adhered to the mounting surface of the mounting member, the adhesive layer comprising a plurality of adhesive pads separated by adhesive boundaries, each of the adhesive pads being adhered to one of the microelectronic components, the mounting member being less adherent to the adhesive pads than to the adhesive boundaries.

40. The microelectronic subassembly of claim 39 wherein the adhesive pads have peripheries defined by cuts in the adhesive layer.

41. The microelectronic subassembly of claim 40 wherein the cuts extend through substantially an entire thickness of the adhesive layer.

42. The microelectronic subassembly of claim 40 wherein the cuts define perforations between the adhesive pads and the adhesive boundaries.

43. The microelectronic subassembly of claim 39 wherein the adhesive boundaries are joined in a continuous structure defining a grid between the adhesive pads.

44. The microelectronic subassembly of claim 39 wherein the adhesive pads and the adhesive boundaries comprise the same material applied as a continuous adhesive layer and subsequently cut to define the adhesive pads and the adhesive boundaries.

45. The microelectronic subassembly of claim 39 wherein the mounting member comprises a backing tape and a release liner, the release liner being carried between the backing tape and the adhesive layer.

46. The microelectronic subassembly of claim 39 wherein the adhesive layer comprises a radiation-sensitive material adapted to change adherence to the mounting member in response to exposure to radiation.

47. The microelectronic subassembly of claim 39 wherein the adhesive layer comprises a radiation-sensitive material which reduces adherence to the mounting member in response to exposure to radiation.

48. The microelectronic subassembly of claim 39 wherein each of the microelectronic components has a back surface, each adhesive pad covering less than the entire back surface of the microelectronic component to which it is adhered.

49. The microelectronic subassembly of claim 39 wherein each of the microelectronic components has a back surface having a back surface area, each adhesive pad having a contact area in contact with the back surface of one of the microelectronic components, the contact area being less than the back surface area of the microelectronic component to which it is adhered.